IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS	:	S. Schwartz
SERIAL NO.	:	09/072,412
FILED	:	May 4, 1998
FOR	:	MICROPHONE-TAILORED EQUALIZING SYSTEM
GROUP ART UNIT	:	2644
EXAMINER	:	B. Pendleton

M/S: APPEAL BRIEFS - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ATTENTION: Board of Patent Appeals and Interferences

REPLY BRIEF UNDER 37 C.F.R §1.193

Dear Sir:

This is in reply to issues raised by the Examiner in his Answer of July 22, 2005. Claims 1-5, 13-15, 28-32, and 36-41 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Bruce Bartlett, "Tonal Effects of Close Microphone Placement" ("Bartlett") in view of U.S. Patent No. 6,141,425 to Murayama ("Murayama").

The Error of the Examiner's Analysis In Finding Claims 1-5, 13-15, 28-32, and 36-41 Unpatentable

Appellant believes that the Examiner's conclusion of unpatentability of claims 1-5, 13-15, 28-32, and 36-41 is based on a misunderstanding or misinterpretation of the claims and the prior art. In general, the Examiner does not address the advantages provided by features described in the claims which teach (1) the choosing of a specific location for the transducer (e.g., microphone) placement and (2) the construction of devices which reduce the basic premise of the Bartlett reference to specific embodiments. These advantages include simplification of knowledge required, reduction of equipment required, and reduction of associated costs of money and time. These reductions also pave the way for superior solutions in situations where prior art technology might be available, but the time to operate it would not be feasible (e.g., live performance situations). It also seems the examiner misinterprets the data of the Bartlett reference to be much more than it is (by a newly included contention involving the use of the word 'exact'), and there is a newly presented interpretation of Claim 5. Four points can thus be identified, concerning Construction, Placement, Prior Art Data, and Claim 5.

CONSTRUCTION:

Independent claim 1, as example, refers to (step 1) determining a selected location proximate to an acoustical generator, and (step 5) comparing sounds of the acoustical generator as picked up by a microphone at the selected location and reference sounds generated by the acoustical generator. The claim further refers to (steps 7-8) assembling first and second filter elements that include components selected to compensate for first and second differences in levels based on the comparison. Finally (step 9) an equalizer is constructed by arranging the first

and second filters to compensate for the differences from the comparison. The result is a tailored equalizer that can be used with a microphone that is placed at or near the selected location with respect to the acoustical generator (e.g., musical instrument) in different settings.

Neither Bartlett nor Murayama teach or describe the construction of a device to compensate for the differences between sounds as described above. On this point, the Examiner does not take the limitations of the claims into consideration, but instead asserts that a previously constructed graphic equalizer meets the limitations of the claims. For example, from Examiner's Answer of July 22, 2005, Page 12 line 13: "The rejection proposes using an existing device, a graphic equalizer. An audio engineer is trained to use equalizers to achieve a desired sound. A desired sound would have been realized in a reasonable amount of time using the graphic equalizer of Murayama. Examiner is not re-interpreting Bartlett to the domain of design and construction, but rather using an existing equalizer (which is constructed according to its setting), which still reads on the claims."

The language of the claims, however, are more specific than simply "using an existing equalizer." Claim 1, for example recites "(7) assembling a first filter element, said first filter element including components selected to compensate for said first difference in level over said first discrete frequency range; (8) assembling a second filter element, said second filter element including components selected to compensate for said second difference in level over said second discrete frequency range; (9) constructing an equalizer for the first microphone by arranging said first and second filter elements so as to compensate for the first and second differences between the sounds as picked up by the microphone at the selected location and the reference sounds as generated by the acoustical generator." These elements specifically go to assembling and constructing filter elements and an equalizer to compensate for particular

differences between reference sounds and those picked up by the first microphone as described earlier in the claim. Neither Bartlett nor Murayama teach or suggest such a construction. In particular, while the Bartlett reference teaches to improve a process of equalizing for a particular circumstance with the addition of an analysis using a frequency analyzer to compare the sound of a deficient microphone placement with the sound of a superior placement, the present invention informs a specially constructed device and system with the information (spectral curves, etc.) that may be gathered from such analysis using complete data sets that are beyond the teaching of Bartlett or other prior art (e.g., from page 21 top of the original application):

> "To obtain a complete record, the instrument should be played through a succession of notes and chords covering its full range, along with representative musical excerpts. This entire process is repeated with several instruments of the same type to be sure that differences in individual instruments are accounted for and will work within the final design parameters."

Once the device is constructed, the analyzer, generation and analysis of spectral curves, equalizers, the entire comparison process, and the equalizing steps of Bartlett are NO LONGER NEEDED, even when there are changes in the acoustical generator (from small to large tom-tom drum) and environment (different rooms or placement in a room). Additionally, the Examiner's Answer does not address the effects of time restraints when it asserts in the above sentence "A desired sound would have been realized in a reasonable amount of time using the graphic equalizer of Murayama." Setting up the reference microphone, making the recordings (which must be made without other sound interfering), playing back in an environment quiet enough to hear in and tuning with a complex series of equalizers takes MUCH more time (half-hour to an

hour, vs. 5 minutes or less for the present invention) even in an ideal situation (e.g., that of a recording studio); and using the Bartlett method is impossible both in implementation and time required for most live (concert) performances, where the noisy environment and/or the short time period between one band leaving the stage and the next band coming onto the stage make it untenable.

PLACEMENT

Much discussion has ensued, and claims have been revised several times, to distinguish between the ever-changing mic placement of Bartlett and the prior art, and the fixed "selected location" described in steps 1 and 2 of claims 1, 5, 13 and 32. That the mic placement as taught in Bartlett is not fixed has been noted in several references shown on pages 11-12 of the Appeal Brief filed 14 Apr 2005. One example of the fixed nature of the placement in the present invention is seen in step 7 of Claim 5, which omits the placement step 1 from the repetition loop of step 7, indicating that the placement of the microphone in relation to the acoustical generator is to be the same for all instances of a given type of acoustical generator. This indicates that the key feature of the determining step 1 of the several present claims is beyond the scope of the placement as indicated in Bartlett and other prior art.

PRIOR ART DATA

From Examiner's Answer of July 22, 2005, Page 7 Line 16:

"... the final rejection relies on the teaching that the inverse of the spectral curves shown in Bartlett show the **exact** equalization needed for improving the sound of a close-miked

instrument and a graphic equalizer would be more appropriate for realizing the inverse of the curves."

The examiner is mis-interpreting Bartlett's data. The spectral curves themselves shown in Bartlett would be DIFFERENT for every measurement taken. Bartlett indicates a very small data set [see Bartlett, p. 738, Appendix section A2]:

"To provide this signal with acoustic guitar, the player continuously and rapidly strummed an E chord. Then he strummed an A chord."

Bartlett also warns, in passing, of how limited his data set is [see Bartlett, p. 727, Section 3, first paragraph, sentence 5]:

"Note that different models of the same instrument have different directional properties (radiation characteristics); also, the radiation pattern varies from note to note. The measurements presented here are meant to indicate only general trends."

The Appellant can easily demonstrate that the spectral curves will be different for every change of instrument model, room placement, change of player, and material played (each different note, chord, group of chords, segment of a musical piece, etc.). The examiner's assertion "...the spectral curves shown in Bartlett show the **exact** equalization needed..." is true ONLY for the single instance of data (the test recording), which is itself not even exactly repeatable. Thus, the prior art does not disclose the features of the claims. The Appellant believes that the examiner has misinterpreted the prior art by interpreting it in the context of the teaching of the present invention.

Claim 5

Claim 5 is similar to claim 1, but refers to repeating the producing and comparing steps for a plurality of embodiments of a selected type of acoustical generator and constructing a tailor-made equalizer to compensate for the differences in the repeated comparing steps. The claim should be read as referring to creating a tailor-made equalizer for a type of acoustic generator based on the prior steps performed on different embodiments of the acoustic generator. Throughout the prosecution of this case, claim 5 has been interpreted in such a manner. In the current Answer (see Answer of July 22, 2005, Page 8 Par 2), for the first time, the claim has been interpreted as performing the generating/comparing steps for a plurality of embodiments of the acoustic generator, but then constructing a tailor-made equalizer to compensate for differences between reference sounds and those picked up by the first microphone, for only one of the embodiments. Such an interpretation renders the repeating operation of step (7) as meaningless and completely at odds with invention as recited in this claim. Though the claim is clear as written, Appellant would agree to amend Claim 5 by changing the last word from "generator" to "generators" if necessary to achieve allowance of the claim.

AN OBSERVATION ABOUT THE ALLEGATION OF OBVIOUSNESS

Excluding the presently claimed invention, no devices or methods that provide the benefits of the presently claimed invention have come to exist in the 25 years since Bartlett's paper. In the cited prior art, it is known that solutions to the problems which Bartlett addressed are incredibly complex. Until ALL the steps of the presently claimed method were followed and

repeated with many instruments and the data compiled, the simple solutions of the claimed method did not exist. It would not be obvious to one skilled in the art to put forth the effort required for the development of the claimed method since one cannot assume that a solution with some sort of success existed, and the expected complexity of the results would not lead one to assume that success. This indicates that the devices or methods of the present invention are NOT obvious.

SPECIFIC POINTS

The following addresses some of the points made in the Examiner's Answer. However, the main points have been covered in the four main topics as treated above.

From Examiner's Answer of July 22, 2005, Page 3 Line 12: "Also in section 5, it was suggested that the inverse of the spectral curve shown in the figures is the equalization required to make a close-mike instrument sound as it does at the reference point (1 meter away). Thus, steps 1 through 6 are taught by Bartlett: a selected location proximate to an acoustical generator is determined and a microphone is placed at the location (figure 2),..."

The Bartlett reference teaches to improve the process of equalizing for deficiencies in a microphone's placement. Bartlett suggests that in addition to the usual process of using a trained ear, accuracy will be improved with the addition of an analysis using a frequency analyzer to compare the sound of the deficient microphone placement with the sound of a superior

placement. With embodiments of the present invention, a specially constructed device is prepared for a specific microphone placement. Accordingly, such a constructed device can be used with the acoustic generator in a variety of environments. Bartlett teaches that the equalizing performed in one room with one placement of the microphone relevant to the acoustic generator should be done again for each environment. Thus, Bartlett does not teach or suggest constructing a device to compensate for differences between reference sounds and those picked up by a microphone. With embodiments of the present invention, the spectrum analyzer is not needed when using the constructed device of the claims in different environments.

Also, Bartlett never selects/defines a specific position, and never suggests that there is a superior or optimum position for the microphone; he only proposes a method for improving the accuracy of an experimental process. His language is entirely aimed at what was and is 'known' in the art, that every change of instrument, change of room, change of environment, will result in something different, and will require experimenting. The present invention teaches that a device may be constructed which will function independently of changes in room/environment, and in an embodiment constructed with the tailored ranges described in claims (see claims 5, 13, 28-30, 31, 37, 38, 40, 41) independently of changes to instrument. This teaching involves the choice of a SPECIFIC UNCHANGING location to use in conjunction with the construction of a specialized device to easily accommodate the signal from the specified location.

From Examiner's Answer of July 22, 2005, Page 4 Line 13: "Accordingly, with this teaching, which demonstrated a well known practice in the art, one would have been motivated

to use a graphic equalizer to correct for the differences in the closely miked sounds and reference sounds."

The Murayama reference teaches a graphic equalizer and discusses some of its construction. Though Bartlett suggests using an equalizer to make the sounds received by a microphone sound better, he does not suggest constructing one, which is clearly recited in the claims. Murayama cannot be said to compensate for the deficiencies of Bartlett. Murayama teaches how to construct a graphic equalizer, a well-known device, but there is nothing in Murayama that teaches or suggests constructing an equalizer to compensate for differences between reference sounds and those picked up by a microphone. Murayama pertains to a more global issue of making a filter embodiment that allows its shape to be constant while varying a center frequency.

At the bottom of Page 6 of the Examiner's Answer it states: "With regard to claim 1, which is argued on pages 7-9 of the Appeal Brief, Appellant does not present convincing arguments that Bartlett and Murayama should not be combined."

Though Bartlett and Murayama can be combined to use a graphic equalizer to improve the spectral curve described in Bartlett, there is nothing in the two references that teaches construction of a specialized equalizer to compensate for differences between reference sounds and those picked up by a microphone

From Examiner's Answer of July 22, 2005, Page 7 Line 7: "In fact, Bartlett teaches that the inverse of the spectral curves showing the difference between the generated sounds by the acoustic instrument picked up by a close microphone and the reference sounds at picked up by a microphone at 1 meter away from the instrument provide the exact equalization needed to make the close-miked sound more natural (page 731)." And also Page 7 Line 16 : "[T]he final rejection relies on the teaching that the inverse of the spectral curves shown in Bartlett show the exact equalization needed for improving the sound of a close-miked instrument and a graphic equalizer would be more appropriate for realizing the inverse of the curves."

Bartlett's data is being misinterpreted. The spectral curves themselves shown in Bartlett would be DIFFERENT for every measurement taken. Bartlett indicates a very small data set [see Bartlett, p. 738, Appendix section A2]: "To provide this signal with acoustic guitar, the player continuously and rapidly strummed an E chord. Then he strummed an A chord." Bartlett also warns, in passing, of how limited his data set is [see Bartlett, p. 727, Section 3, first paragraph, sentence 5]: "Note that different models of the same instrument have different directional properties (radiation characteristics); also, the radiation pattern varies from note to note. The measurements presented here are meant to indicate only general trends."

The Appellant can easily demonstrate that the spectral curves will be different for every variation of instrument model, placement in room, change of player, and sonic material played (each different note, chord, group of chords, segment of a musical piece, etc.). The examiner's assertion "...the spectral curves shown in Bartlett show the exact equalization needed..." is true ONLY for the single instance of data (the test recording), which is itself not even exactly

repeatable; the next time the same player plays the same material on the same instrument, it will be somewhat different, and the curves will be different if only part of the test recording were used (e.g., any of the first, second, or third thirds of the data set). Bartlett understands that his data produces results that are not exact at all, but are instead only minimal guidelines [see Bartlett, p. 727, Section 2]: "2 TONAL CORRECTION If a sound engineer wants an instrument to sound "natural" or "well balanced" when miked up close, the following can be attempted: 1) equalize the instrument so that it sounds "right," 2) choose a microphone that makes the instrument sound right, or 3) find a microphone placement close to the instrument that sounds right. The purpose of this report is to help the sound engineer accomplish these objectives more efficiently." (See also, Bartlett, p. 727, Section 3, first paragraph, sentence 8: "This position for a well-balanced timbre, a matter of taste, was based on our experience and a study of several articles and textbooks on microphone techniques [3-11].") The examiner is interpreting the teaching of Bartlett as if it has shown some precise response curve, which it does not; it only shows that experimenting with response curves can be helpful.

CONCLUSION

In conclusion, Appellants submit that the Examiner has improperly construed the claims on appeal, misreading the elements that are at the heart of the claimed invention. These elements are missing from the cited art and Appellant submits that, because of this, the Examiner's rejection should be reversed.

The Examiner's Answer was dated July 22, 2005, so this Reply Brief is timely filed.

The Commissioner is hereby authorized to charge any additional fees required or credit any overpayment in connection with this correspondence to KENYON & KENYON, Deposit Account No. **11-0600**.

Respectfully submitted,

KENYON & KENYON

Date: September 22, 2005

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